

CLAIMS

1. A film comprising at least a multivalent metal salt of a polycarboxylate-based polymer (A),

wherein the density is not lower than 1.80 g/cm³,

5 wherein the surface ratio α [the peak surface S₁(3700 to 2500 cm⁻¹)/the peak surface S₂(1800 to 1500 cm⁻¹)] of an infrared absorption spectrum is not larger than 2.5, and

10 wherein the peak ratio β [the peak A₁(1560 cm⁻¹)/the peak A₂(1700 cm⁻¹)] of the infrared absorption spectrum is not smaller than 1.2.

2. The film according to claim 1, comprising a multivalent metal in an amount which is not smaller than 0.5 chemical equivalents relative to all the carboxyl groups contained in the polycarboxylate-based polymer (A).

3. The film according to any one of claims 1 and 2, wherein the polycarboxylate-based polymer (A) is any one of a homopolymer, a copolymer, and a mixture of the homopolymer and the copolymer, which contains at least 20 one type of polymerizable monomer selected from the group consisting of acrylic acid, maleic acid and methacrylic acid.

25 4. The film according to any one of claims 1 to 3, wherein the multivalent metal is a divalent metal.

5. The film according to any one of claims 1 to

4, wherein the water vapor permeability is not larger than 15 g/m²·day (at 40°C at a relative humidity of 90%).

5 6. The film according to any one of claims 1 to 5, wherein the oxygen permeability is not larger than 1000 cm³(STP)/(m²·day·MPa) (at 30°C at a relative humidity of 80%).

7. A laminate comprising the film according to any one of claims 1 to 6 and a substrate, wherein the film is arranged on at least one surface of the substrate.

10 8. A method of manufacturing a film, in which the surface ratio α [the peak surface S₁(3700 to 2500 cm⁻¹)/the peak surface S₂(1800 to 1500 cm⁻¹)] of an infrared absorption spectrum is not larger than 2.5, the peak ratio β [the peak A₁(1560 cm⁻¹)/the peak A₂(1700 cm⁻¹)] of the infrared absorption spectrum is not smaller than 1.2, and the density is not lower than 1.80 g/cm³, the method comprising the steps of:

20 applying, to a substrate, any one of a solution and a dispersant (coating liquid) of a mixture containing a polycarboxylate-based polymer (A), a multivalent metal compound (B), any one of a volatile base (C) and an acid (D), and a solvent;

thus forming a film; and

25 thereafter treating the film with heat at a temperature in a range of 60°C to 400°C while being putted together with the substrate or while being separated from

the substrate.

9. The method of manufacturing a film according to claim 8, wherein the multivalent metal compound (B) is added in an amount which is not smaller than 0.5 chemical
5 equivalents relative to all the carboxyl groups contained in the polycarboxylate-based polymer (A).

10. The method of manufacturing a film according to any one of claims 8 and 9, wherein the polycarboxylate-based polymer (A) is any one of a homopolymer, a copolymer, and a mixture of the homopolymer
10 and the copolymer, which contains at least one type of polymerizable monomer selected from the group consisting of acrylic acid, maleic acid and methacrylic acid.

11. The method of manufacturing a film according
15 to any one of claims 8 to 10, wherein the multivalent metal compound (B) is a divalent metal compound.